

Curriculum Vitae

Hye-Sung Lee

April 14, 2010

Email: hlee@bnl.gov

Homepage: <http://quark.phy.bnl.gov/~hlee/>

Address: Department of Physics, Brookhaven National Lab, PO Box 5000, Upton, NY 11973

Phone: 631-344-5933 Fax: 631-344-5519

Nationality: South Korea

Gender: Male

Marital Status: Married

Research Interests

My primary research areas are (i) Beyond the Standard Model (including Supersymmetry and Extra gauge symmetry) and (ii) Cosmology (including Dark matter). I am interested in various phenomenology including model building, collider physics and dark matter physics.

Education

Sep. 1999 - Aug. 2005 Ph.D. in Physics, University of Wisconsin - Madison
(Thesis: Phenomenology of the $U(1)'$ -extended minimal supersymmetric standard model)

Mar. 1996 - Feb. 1998 M.S. in Physics, Korea Advanced Institute of Science and Technology, Korea

Mar. 1992 - Feb. 1996 B.S. in Physics, Korea Advanced Institute of Science and Technology, Korea

Professional Experience

Oct. 2009 - Present Post-doctoral Research Associate
Physics Department, Brookhaven National Lab

Sep. 2008 - Sep. 2009 Post-doctoral Research Associate
Physics & Astronomy Department, University of California - Riverside

Sep. 2005 - Aug. 2008 Post-doctoral Research Associate
Physics Department, University of Florida

Sep. 1999 - Aug. 2005 Research Assistant and Teaching Assistant
Physics Department, University of Wisconsin - Madison

Mar. 1996 - Feb. 1998 Graduate Assistant
Physics Department, Korea Advanced Institute of Science and Technology, Korea

Awards

Nov 2004 The Vilas Travel Fellowship (expense of travel for research purpose)
from Graduate Student Council, University of Wisconsin - Madison

May 2000 The Emmanuel R. Poire Award (for distinguished achievement in the study of Physics)
from Department of Physics, University of Wisconsin - Madison

Publication List

I have written 21 papers and 5 conference proceedings or reports with total citations of 962 (775 for the published only). For the up-to-date publication list and citation numbers, type-in FIND EA LEE, HYE-SUNG OR EPRINT HEP-PH/0608079 at the SPIRES homepage <http://www.slac.stanford.edu/spires/>

1. Bound on Z' Mass from CDMS II in the Dark Left-Right Gauge Model II
Shaaban Khalil, Hye-Sung Lee, Ernest Ma
Accepted to publish at PRD. [arXiv:1002.0692 [hep-ph]] – 2 times
2. Gauged $B - x_i L$ origin of R parity and its implications
Hye-Sung Lee, Ernest Ma
Accepted to publish at PLB. [arXiv:1001.0768 [hep-ph]]
3. New physics search at the LHC via Z' resonance
Hye-Sung Lee
To appear in the proceedings of SUSY 2009 by AIP Conf. Proc. [arXiv:0909.4049 [hep-ph]]
4. Six-Lepton Z' Resonance at the Large Hadron Collider
Vernon Barger, Paul Langacker, Hye-Sung Lee
Phys. Rev. Lett. 103 (2009) 251802 [arXiv:0909.2641 [hep-ph]] – 6 times
(This work has been highlighted in Synopsis in *Physics*. <http://physics.aps.org>)
5. Generalized Lepton Number and Dark Left-Right Gauge Model
Shaaban Khalil, Hye-Sung Lee, Ernest Ma
Phys. Rev. D79 (2009) 041701 (rapid communications) [arXiv:0901.0981 [hep-ph]] – 13 times
6. Dileptons and four leptons at Z' resonance in the early stage of the LHC
Hye-Sung Lee
Phys. Lett. B674 (2009) 87-91 [arXiv:0812.1854 [hep-ph]] – 8 times
7. R -parity violating $U(1)'$ -extended supersymmetric standard model
Hye-Sung Lee
Mod. Phys. Lett. A23 (2008) 3271-3283 (invited brief review) [arXiv:0811.2539 [hep-ph]] – 2 times
8. Common gauge origin of discrete symmetries in observable sector and hidden sector
Taeil Hur, Hye-Sung Lee, Christoph Luhn
JHEP 0901 (2009) 081 [arXiv:0811.0812 [hep-ph]] – 13 times
9. Lightest U -parity Particle (LUP): a hidden sector dark matter candidate
Hye-Sung Lee
AIP Conf. Proc. 1078 (2009) 569-571 (SUSY 2008) [arXiv:0808.3600 [hep-ph]] – 2 times
10. Lightest U -parity Particle (LUP) dark matter
Hye-Sung Lee
Phys. Lett. B663 (2008) 255-258 [arXiv:0802.0506 [hep-ph]] – 24 times
11. Discrete gauge symmetries and proton stability in the $U(1)'$ -extended MSSM
Hye-Sung Lee, Christoph Luhn, Konstantin T. Matchev
JHEP 0807 (2008) 065 [arXiv:0712.3505 [hep-ph]] – 20 times
12. Supersymmetric $U(1)'$ Model with Multiple Dark Matters
Taeil Hur, Hye-Sung Lee, Salah Nasri
Phys. Rev. D77 (2008) 015008 [arXiv:0710.2653 [hep-ph]] – 33 times
13. $U(1)'$ solution to the μ -problem and the proton decay problem in supersymmetry without R -parity
Hye-Sung Lee, Konstantin T. Matchev, Ting T. Wang
Phys. Rev. D77 (2008) 015016 [arXiv:0709.0763 [hep-ph]] – 23 times

14. Revival of the Thermal Sneutrino Dark Matter
Hye-Sung Lee, Konstantin T. Matchev, Salah Nasri
Phys. Rev. D76 (2007) 041302 (rapid communications) [hep-ph/0702223] – 30 times
15. CP Studies and Non-Standard Higgs Physics
Sabine Kraml et al.
CPNSH workshop report [hep-ph/0608079] – 179 times
16. Higgs Sector in Extensions of the MSSM
Vernon Barger, Paul Langacker, Hye-Sung Lee, Gabe Shaughnessy
Phys. Rev. D73 (2006) 115010 [hep-ph/0603247] – 83 times
17. Properties of the Lightest Neutralino in MSSM Extensions
Vernon Barger, Paul Langacker, Hye-Sung Lee
AIP Conf. Proc. 805 (2006) 306-309 (PASCOS 2005) [hep-ph/0509112] – 4 times
18. Lightest Neutralino in Extensions of the MSSM
Vernon Barger, Paul Langacker, Hye-Sung Lee
Phys. Lett. B630 (2005) 85-99 [hep-ph/0508027] – 47 times
19. Muon Anomalous Magnetic Moment in a Supersymmetric $U(1)'$ Model
Vernon Barger, Chung Kao, Paul Langacker, Hye-Sung Lee
Phys. Lett. B614 (2005) 67-77 [hep-ph/0412136] – 13 times
20. Neutralino Relic Density in a Supersymmetric $U(1)'$ Model
Vernon Barger, Chung Kao, Paul Langacker, Hye-Sung Lee
Phys. Lett. B600 (2004) 104-115 [hep-ph/0408120] – 32 times
21. Solution to the $B \rightarrow \pi K$ Puzzle in a Flavor-Changing Z' Model
Vernon Barger, Cheng-Wei Chiang, Paul Langacker, Hye-Sung Lee
Phys. Lett. B598 (2004) 218-226 [hep-ph/0406126] – 93 times
22. Big Bang Nucleosynthesis Constraints on Z' Properties
Vernon Barger, Paul Langacker, Hye-Sung Lee
To appear in the proceedings of SUSY 2003 by World Scientific [hep-ph/0402048] – 2 times
23. Z' Mediated Flavor Changing Neutral Currents in B Meson Decays
Vernon Barger, Cheng-Wei Chiang, Paul Langacker, Hye-Sung Lee
Phys. Lett. B580 (2004) 186-196 [hep-ph/0310073] – 80 times
24. Effective number of neutrinos and baryon asymmetry from BBN and WMAP
V. Barger, James P. Kneller, Hye-Sung Lee, Danny Marfatia, Gary Steigman
Phys. Lett. B566 (2003) 8-18 [hep-ph/0305075] – 132 times
25. WMAP and Inflation
V. Barger, Hye-Sung Lee, Danny Marfatia
Phys. Lett. B565 (2003) 33-41 [hep-ph/0302150] – 96 times
26. Primordial Nucleosynthesis Constraints on Z' Properties
Vernon Barger, Paul Langacker, Hye-Sung Lee
Phys. Rev. D67 (2003) 075009 [hep-ph/0302066] – 25 times

Talks and Seminars

I gave 22 seminars/colloquiums and 10 conference/workshop talks.

1. Colloquium at University of Kansas (Apr. 2010)
New force and the LHC

2. Seminar at Brookhaven National Lab (Mar. 2010)
Flavor-dependent gauge origin of R -parity
3. Colloquium at University of Kansas (Feb. 2010)
New force and the LHC
4. Seminar at Brookhaven National Lab (Aug. 2009)
 $U(1)'$ instead of R -parity
5. UKC 2009 at Raleigh, NC (Jul. 2009)
Stability mechanism for proton and dark matter
6. SUSY 2009 at Boston, MA (Jun. 2009)
New physics search via Z' resonance
7. Seminar at University of California - Riverside (May 2009)
New physics search via Z' resonance
8. Seminar at Carleton University, Canada (Jan. 2009)
 $U(1)'$ -extended Supersymmetric Standard Model
9. Seminar at University of California - Riverside (Oct. 2008)
Stability of proton and dark matter without R -parity, and LHC implications
10. SUSY 2008 at Seoul, Korea (Jun. 2008)
Lightest U -parity Particle (LUP) dark matter
11. Seminar at Yonsei University, Korea (Jun. 2008)
Proton and dark matter without R -parity
12. Seminar at Argonne National Lab (Jun. 2008)
Proton and dark matter without R -parity
13. Seminar at Fermi National Lab (May 2008)
Proton and dark matter without R -parity
14. PHENO 2008 at Madison, WI (Apr. 2008)
Lightest U -parity Particle (LUP) dark matter
15. Seminar at Johns Hopkins University (Apr. 2008)
 R -parity violating $U(1)'$ -extended MSSM
16. Seminar at University of Maryland (Mar. 2008)
 R -parity violating $U(1)'$ -extended MSSM
17. Seminar at The Ohio State University (Mar. 2008)
 R -parity violating $U(1)'$ -extended MSSM
18. Seminar at University of Florida (Mar. 2008)
 R -parity violating $U(1)'$ -extended MSSM
19. Seminar at University of Wisconsin (Mar. 2007)
Sneutrino Dark Matter in the $U(1)'$ -extended MSSM
20. Seminar at University of Florida (Mar. 2007)
Sneutrino Dark Matter in the $U(1)'$ -extended MSSM
21. Seminar at KAIST, Korea (Jan. 2007)
Cold Dark Matter Candidates in the $U(1)'$ -extended MSSM
22. Seminar at KIAS, Korea (Jan. 2007)
Cold Dark Matter Candidates in the $U(1)'$ -extended MSSM

23. UF-FSU Symposium on HEP (Nov. 2005)
Properties of the Lightest Neutralino in Extensions of the MSSM
24. SUSY 2005 at Durham, UK (Jul. 2005)
Lightest Neutralino in Extensions of the MSSM
25. Seminar at KAIST, Korea (Jun. 2005)
Phenomenology of $U(1)'$ -extended MSSM
26. PASCOS 2005 at Gyeongju, Korea (Jun. 2005)
Lightest Neutralino in Extensions of the MSSM
27. Seminar at University of Florida (Mar. 2005)
Phenomenology of $U(1)'$ -extended MSSM
28. Seminar at University of Wisconsin (Mar. 2005)
Phenomenology of $U(1)'$ -extended MSSM
29. Seminar at Iowa State University (Feb. 2005)
Phenomenology of $U(1)'$ -extended MSSM
30. PHENO 2004 at Madison, WI (Apr. 2004)
Solution to the $B \rightarrow \pi K$ Puzzle in a Flavor Changing Z' Model
31. SUSY 2003 at Tucson, AZ (Jun. 2003)
Big Bang Nucleosynthesis Constraints on Z' Properties
32. PHENO 2003 at Madison, WI (May 2003)
Primordial Nucleosynthesis Constraints on Z' Properties

Conferences and Workshops Attended

I attended 18 conferences/workshops.

1. UKC 2009
Raleigh, NC (Jul 16-19, 2009)
2. SUSY 2009
Boston, MA (June 5-10, 2009)
3. West Coast LHC Theory Meeting
University of California - Riverside (April 17, 2009)
4. SUSY 2008
Seoul, Korea (June 16-21, 2008)
5. PHENO 2008
Madison, WI (April 28-30, 2008)
6. UF-FSU Symposium on HEP
University of Florida (November 11, 2005)
7. SESAPS 2005
Gainesville, FL (November 10-12, 2005)
8. SUSY 2005
Durham, UK (July 18-23, 2005)
9. PASCOS 2005
Gyeongju, Korea (May 30 - June 4, 2005)

10. PHENO 2005
Madison, WI (May 2-4, 2005)
11. Northwestern Mini-Workshop on Z' s
Northwestern University (November 16, 2005)
12. TeV4LHC
Fermilab (September 16-18, 2005)
13. TASI 2004
University of Colorado (June 6 - July 2, 2004)
14. PHENO 2004
Madison, WI (April 26-28, 2004)
15. SUSY 2003
Tucson, AZ (June 5-10, 2003)
16. PHENO 2003
Madison, WI (May 5-7, 2003)
17. NESS 2002
Washington, DC (September 19-21, 2002)
18. PHENO 2002
Madison, WI (April 22-24, 2002)

Memberships

1. American Physical Society (APS) since 2005
2. Korean-American Scientists and Engineers Association (KSEA) since 2009
3. Association of Korean Physicists in America (AKPA) since 2009

Teaching Experience

1. Spring 2005, Physics 103 TA, University of Wisconsin
2. Fall 2001, Physics 103 TA, University of Wisconsin
3. Summer 2001, Physics 103 TA, University of Wisconsin
4. Spring 2001, Physics 103 TA, University of Wisconsin
5. Spring 2000, Physics 104 TA, University of Wisconsin
6. Fall 1999, Physics 202 TA, University of Wisconsin
7. Fall 1997, Physics 142 TA, KAIST
8. Spring 1997, Physics 141 TA, KAIST

Computational Skills

1. I have used **Fortran** and **Mathematica** extensively for my various research projects.
2. I am familiar with packages **CompHEP**, **micrOmegas**, **MadGraph**, **Pythia**, and have used them for my research projects. Especially, I constructed a new **CompHEP** model file for the $U(1)'$ -extended MSSM and used it to calculate the dark matter relic density of the model.
3. I used Condor system (<http://www.cs.wisc.edu/condor/>) that runs more than 200 CPUs for high-speed parallel computing when I analyzed WMAP Cosmic Microwave Background data with **CAMB** software.
4. I took several computer science courses and I am quite familiar with other languages including C and Java.

Other Activities

1. I attended TASI (Theoretical Advanced Study Institute in Elementary Particle Physics) [Topic: Physics in $D \geq 4$] held at University of Colorado at Boulder during June 6 - July 2, 2004.
2. I made and have managed the website *The Z' Hunter's Guide* (useful introduction and links of Z' study) at <http://sites.google.com/site/zprimeguide/>
3. I have been giving a series of talks about the supersymmetry and its phenomenology at PH835 (Collider Physics class). My talk slides are available at <http://quark.phy.bnl.gov/~hlee/lectures/>
4. I have been serving as a referee for Physical Review Letters (PRL) and Physical Review D (PRD) since 2006.
5. I have been serving as a referee for Journal of Cosmology and Astroparticle Physics (JCAP) since 2008.
6. I served as a local organizer for the 7th West Coast LHC Theory Meeting (April 17, 2009). <http://physics.ucr.edu/wclhct2009/UCRworkshop.html>
7. I have been helping the Association of Korean Physicists in America (AKPA) as a webmaster and a member of the publicity and editorial committee since 2009. <http://www.akpa.org>

References

- | | |
|--------------------|---|
| Vernon Barger | Professor (Thesis Advisor)
barger@physics.wisc.edu
Department of Physics, University of Wisconsin, Madison, WI 53706 |
| Hooman Davoudiasl | Assistant Physicist
hooman@bnl.gov
Department of Physics, Brookhaven National Lab, Upton, NY 11973 |
| Paul Langacker | Member (IAS), Emeritus Professor (UPenn)
pgl@ias.edu
School of Natural Sciences, Institute for Advanced Study, Princeton, NJ 08540
Department of Physics & Astronomy, University of Pennsylvania, Philadelphia, PA 19104 |
| Ernest Ma | Professor
ernest.ma@ucr.edu
Department of Physics & Astronomy, University of California, Riverside, CA 92521 |
| Konstantin Matchev | Associate Professor
matchev@phys.ufl.edu |

	Department of Physics, University of Florida, Gainesville, FL 32611
Salah Nasri	Assistant Professor snasri@uaeu.ac.ae Department of Physics, UAE University, Al-Ain, UAE
Amarjit Soni	Senior Physicist, HET Group Leader soni@bnl.gov Department of Physics, Brookhaven National Lab, Upton, NY 11973